R E P O R T R E S U M E S

ED 017 924 48 AL 001 127

A COMPARISON OF INFORMATION PROCESSING ABILITIES OF MIDDLE AND LOWER CLASS NEGRO KINDERGARTEN BOYS.

BY- RYCKMAN, DAVID B.
MICHIGAN UNIV., ANN ARBOR,CTR.FOR RES.LANG.AND BEH

REPORT NUMBER BR-6-1784 PUB DATE 67
CONTRACT OEC-3-061784-0508
EDRS PRICE MF-$0.25 HC-$0.72 16P.

DESCRIPTORS- INFORMATION PROCESSING, *LANGUAGE ABILITY, LANGUAGE TESTS, LANGUAGE DEVELOPMENT, *LOWER CLASS, CULTURAL DISADVANTAGEMENT, *MIDDLE CLASS, *KINDERGARTEN CHILDREN, URBAN LANGUAGE, *NEGRO STUDENTS, SOCIOLINGUISTICS,

A STUDY WAS UNDERTAKEN TO EXAMINE THE NATURE OF THE RELATIONSHIP BETWEEN SOCIAL CLASS AND COGNITIVE ABILITIES OF NEGRO KINDERGARTEN BOYS. FIFTY MIDDLE CLASS AND 50 LOWER CLASS NEGRO KINDERGARTEN BOYS WERE INDIVIDUALLY ADMINISTERED EXTENSIVE TESTS DESIGNED TO ASSESS SPECIFIC INFORMATION PROCESSING ABILITIES. THE EIGHT INSTRUMENTS USED INCLUDED THREE STANDARDIZED TESTS (ILLINOIS TEST OF PSYCHOLINGUISTIC ABILITIES, THE BEERY-BUKTENICA DEVELOPMENTAL FORM SEQUENCE, AND THE WEPMAN AUDITORY DISCRIMINATION TEST), AND FIVE UNSTANDARIZED INSTRUMENTS. A COMPONENT ANALYSIS OF 19 VARIABLES PRODUCED FIVE REASONABLY MEANINGFUL COMPONENTS. THE EVIDENCE FROM THIS STUDY SUGGESTS THAT THE MAJOR DIFFERENTIATING CHARACTERISTIC BETWEEN THE MIDDLE AND LOWER CLASS IS GENERAL LANGUAGE ABILITY. THIS COMPONENT ACCOUNTED FOR THE LARGEST AMOUNT OF THE VARIANCE, PRODUCED THE LARGEST MEAN DIFFERENCE BETWEEN THE GROUPS, AND HAD THE HIGHEST CORRELATION WITH SOCIAL CLASS. THE FINDINGS NOTED IN THE STUDY APPEAR TO SUPPORT STRONGLY THE POSITION THAT CULTURAL DEPRIVATION IS ESSENTIALLY LANGUAGE DEPRIVATION, ESPECIALLY FOR EDUCATIONAL PURPOSES. USING A DEFINITION BASED ON LANGUAGE VARIABLES, RATHER THAN SOCIOECONOMIC VARIABLES, APPEARS TO BE ADVANTAGEOUS IN TERMS OF BOTH IDENTIFICATION AND REMEDIAL OR COMPENSATORY EDUCATIONAL PROGRAMING. FURTHER, THE DEFINITION SHOULD PROBABLY BE BASED ON LANGUAGE USAGE, RATHER THAN ON SUCH LANGUAGE VARIABLES AS VOCABULARY. IMPLICATIONS FOR EDUCATIONAL DEFINITION, DIAGNOSIS, AND PROGRAM PLANNING ARE DISCUSSED IN THIS REPORT, WHICH IS PUBLISHED IN "STUDIES IN LANGUAGE AND LANGUAGE BEHAVIOR, PROGRESS REPORT IV," 1967, BY THE CENTER FOR RESEARCH ON LANGUAGE AND LANGUAGE BEHAVIOR, UNIVERSITY OF MICHIGAN, 220 EAST HURON STREET, ANN ARBOR, MICHIGAN 48108. (AUTHOR/JD)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

BR-6-1784
PA 48

ED017924

A Comparison of Information Processing Abilities of Middle and Lower Class Negro Kindergarten Boys

David B. Ryckman

Center for Research on Language and Language Behavior

Fifty middle class and 50 lower class Negro kindergarten boys were administered a battery of eight instruments designed to assess specific information processing abilities. A component analysis of 19 variables produced five reasonably meaningful components. A General Language Ability component was the most significant component to emerge and, when class groups were compared on component scores, it discriminated most significantly between the groups. Implications for educational definition, diagnosis, and program planning were discussed.

There is a growing realization that lower class children, as a group, are disadvantaged in terms of their ability to achieve in school. Project Head Start and numerous experimental preschool programs for lower class children (Gehlbach, 1965) reflect the growing awareness by educators of the cognitive deficiencies these children possess as they enter school. Yet, surprisingly, few studies have been designed to identify the nature of the relationship between social class and cognitive abilities.

A review of the literature suggests that there is a strong positive relationship between social class and I.Q. (Jones, 1946, 1954; McCandless, 1952, 1964; Masland, Sarason, & Gladwin, 1958; Sarason & Gladwin, 1958). Language studies on social class generally have found that children from lower socioeconomic groups are deficient in language skills from the early development of speech sounds to higher levels of abstract usage (McCarthy, 1930; Davis, 1937; Day, 1933; Young, 1941; Smith, 1935; Siller, 1957; John, 1963; Deutsch, 1965; Anastasi & D'Angelo, 1952; Gehlbach, 1965; Brodbeck & Irwin, 1946; Irwin, 1948a; Irwin, 1948b). Studies which have examined "nonverbal" variables have generally found a superiority for middle class over lower class children, but the relationship with social class is less pronounced (Herrick, 1951; Eells, et al., 1951; Bernstein, 1960).

This study was designed to examine the nature of the relationship between social class and cognitive abilities of Negro kindergarten boys.

The conceptual framework under which this study was developed is called "information processing." This set of constructs has developed through

AL 001 127

work with computers, and can roughly be thought of on the basis of a computer model of intellectual functioning. The basic components in this computer model are an input system, a processing or programming component, and a storage or memory unit. Many individuals working with the information processing constructs have used minor variations of this general model (Bereiter, 1965; Feldman, 1962; Simmons, 1962; Taylor, 1960). The major concern in this approach is the processing or programming component. The computer, or the individual, must have the basic "program" for the utilization of data unput.

The program of the computer is transmitted through the use of machine language, i.e., the symbol system employed for "telling" the machine what to do. The language of the program "tells" the computer what information to accept, i.e., determines the input, where it is to be stored, what operations are to be performed, what order the operations are to follow, and what output shall be given. Language may not be the only medium for program direction in the human information processing system but it is the most important, especially for school work. How effectively and efficiently the person functions is dependent on the "program" that is used for processing the data. Bereiter (1965) suggests that information processing abilities are the essence of intellectual functioning.

It is perhaps impossible to identify all of the individual programs or information processing abilities or systems that may operate (Bereiter, 1965; Simmons, 1962; Taylor, 1960). Consequently, this study was designed to assess only those basic information processing systems which seemed to be associated with successful school performance.

Since language is the major medium for controlling and transmitting the program, language was given particular emphasis in the development of the testing battery. Generally, it seemed useful to examine the basic decoding or input processes, the encoding or basic output processes, and some of the multi-step internal data manipulation processes. It is recognized that there are various levels of behavior that must be considered, i.e., there are basic "automatic" levels of behavior that require little or no conscious data manipulation and there are progressively more complex levels necessary for high level abstract conceptual data manipulation. It should be recognized that assessment must deal with behavior which is the product of the information processing system. Hence, no one unit of the system can be completely isolated. Although one may emphasize one part of the system, e.g., input, one has to deal with the internal manipulations and output as well.

This information processing model provided the necessary framework for selection of relevant tests for the battery. It was also hoped that this model would provide a useful framework for description and assessment of the problems of lower class children in abilities necessary for school achievement.

This study was designed to answer the following questions: (1) What are the specific information processing abilities assessed by the testing battery which significantly discriminate between middle and lower class Negro kindergarten boys? (2) What are the patterns of information processing abilities, as determined by component analysis, which discriminate between the middle and lower class groups? (3) To what extent is there overlap in the distribution of scores for the two socioeconomic groups?

Procedure

Subjects. Administrators of a large metropolitan school district assigned five schools from which the middle and lower class boys were to be selected. Three schools were selected for observing the middle class group and two for the lower class. Socioeconomic determination was made on the basis of census tract data for the areas from which the school population was drawn. *Census tracts are small areas into which large cities and adjacent areas have been divided for statistical purposes. Tract boundaries were established cooperatively by a local committee and the Bureau of the Census, and were generally designed to be relatively uniform with respect to population characteristics, economic status, and living conditions. The average tract has about 4,000 residents* (U.S. Bureau of the Census, 1962, p. 1). The three middle class schools involved three census tracts and the two lower class schools involved four census tracts. The figures for the entire city were used as a reference point. As can be seen from Table 1, the three middle class tracts exceeded the four lower class tracts on all six of the socioeconomic variables. Further, all three of the middle class tracts exceeded

---

Insert Table 1 about here

---

the figures for the city on all variables, except the percentage of dwellings with .075 persons or less per room. On this variable only, tract 2 was below the city percentage. Conversely, the four lower class tracts were

below the city figures on all variables, except for median years of school completed, in which tract four was equal to the city median. Clearly, one group represented the middle class and the other represented the lower class.

The sample consisted of 50 middle class and 50 lower class Negro kindergarten boys between the ages of four years eleven months and five years eleven months. There was a statistically significant age-difference in favor of the lower class boys, i.e., they were older, but this difference of less than two months was not considered behaviorally significant.

Tests applied. An extensive battery of tests was individually administered to each boy. In all, eight instruments were used. Three standardized tests were used: Illinois Test of Psycholinguistic Abilities (ITPA) (McCarthy & Kirk, 1961), Beery-Buktenica Developmental Form Sequence (DFS) (Berry, 1964), and the Wepman Auditory Discrimination Test (WADT) (Wepman, 1958). A brief description will be given of each of the unstandardized instruments.

The Cognitive Maturity Test (CMT) was developed by Englemann (1964) for the specific purpose of assessing language deficits in culturally-disadvantaged children. Englemann's test is designed to assess specific ability to understand the latent structure and fundamental assumptions of language at the statement level (Englemann, 1964; Gehlbach, 1965). The test assesses four abilities: 1) memory for sentences; 2) understanding of syntax; 3) utilization of "patterns" of sounds; and, 4) encoding.

Katz and Deutsch (1963) attempted to eliminate the semantic element in the WADT. They used a similar format found in the Wepman test but substituted Hebrew words.

The Chicago Test of Visual Discrimination (CTVD) was developed as a measure of visual discrimination, using essentially non-meaningful material. Test materials were derived from Bender and Graham-Kendall Memory for Designs Tests (Weiner, et al., 1965). The test was designed and administered as both a memory and a matching task.

The Ryckman-Bereiter-Powell Auditory Closure Test (Ryckman, 1966), which uses a sound blending format, was designed to assess auditory closure with kindergarten Ss. Half of the items require the child to blend syllable units and half use the phoneme format.

The McCarthy-Kass Visual Automatic Test was designed as a test of visual closure (McCarthy, 1965; Kass, 1962; Ryckman, 1966). The test uses an

incomplete picture format. Each item of the test is made up of four cards on which a picture is shown in a progressively more complete form.

The "t" test was used to test for differences between the means for each of the variables. Nineteen variables were then submitted to a Principal Component Analysis with a varimax rotation. Component scores were computed for each individual, and were submitted to statistical analysis via biserial correlations and "t" tests.

Results

All 18 cognitive variables discriminated between the socioeconomic groups in favor of the middle class boys ($p < .01$). The Principal Component Analysis produced five vectors with eigenvalues greater than one. These five components were rotated to a varimax criterion. Table 2 summarizes the five components

---

Insert Table 2 about here

---

and the variables which appeared with a .40 or more component loading. It appears that there was essentially one large component, General Language Ability, and four smaller ones. As can be seen from Table 2, Component I accounted for almost twice as much of the variance as the second largest component. Since reasonably meaningful components were obtained, component scores were computed for each boy. These component scores were then used to compare the groups.

Table 3 shows the biserial coefficients of correlation between social

---

Insert Table 3 about here

---

class and the component scores. The first component, General Language Ability, had the highest correlation with social class, which suggests that General Language Ability is more closely related to social class than any of the other components, and by a substantial degree. It is interesting to note that this correlation is as high or higher than is usually found between social class and I.Q. scores.

The results of the "t" tests on the scores for the five components have been summarized in Table 4. As can be seen, General Language Ability, Component I,

---

Insert Table 4 about here

---

significantly distinguished between the two groups well beyond the .001 level of significance. This finding is of particular interest for three reasons. First, Component I accounts for the largest amount of the rotated variance. Second, ten of the 19 variables contributed their highest loading to this component. Third, the correlation between this component and social class was substantial. These findings clearly indicate class differences in General Language Ability. On Components II and III, the middle class group was superior to the lower class group ($p < .10$). Component IV produced a difference at the .01 level of significance in favor of the middle class group.

Table 4 summarizes the data on the overlap of class medians on each of the components. Examination of this overlap revealed that on Component I

Insert Table 5 about here

---

only 16 per cent of the lower class boys exceeded the median of the middle class boys, and only 20 per cent of the middle class boys fell below the lower class median. There was considerably more overlap on the other components.

A decision was reached to exclude the two auditory discrimination tests from the analyses because they were too difficult for many of the boys in the lower class. Of the 50 lower class boys, a valid score was obtained for only 29 boys on both of these tests. An attempt was made to alter the administration procedures, if the boy was not able to understand the task using standard procedure. Since less than 60 per cent of the lower class boys obtained valid scores, the data were excluded from further analysis. Only four boys from the middle class group did not obtain valid scores. This difference between the groups in ability to successfully complete the task produced a significant chi square: $X = 15.41$; $df = 1$; $p < .01$.

Discussion and Implications

The evidence from this study suggests that the major differentiating characteristic between the middle and lower class boys is General Language Ability. This conclusion is based on the fact that this component accounted for the largest amount of the variance, produced the largest mean difference between the groups, and had the highest correlation with social class. Visual Classification, i.e., the ability to classify or label visual input, was the second most discriminating component in this study. The Structural

Organization and Visual Imagery components produced small mean differences between the class groups in favor of the middle class boys. The Structural Organization component had to do with the ability to retain the whole while manipulating the structural components. The Visual Imagery component was defined as a primitive, "one shot," type of ability which required the child to project or hold a visual image. The Chronological Age component produced the only difference in favor of the lower class boys, i.e., the lower class boys were older than the middle class boys, but the mean difference was very small.

The findings on the component analysis have implications for an educational definition of the culturally-disadvantaged or culturally-deprived. While these two terms have been extensively used in discussing the problems of a group of children, the only consistent definition used has been in terms of social class variables. In short, the culturally-deprived or culturally-disadvantaged children have been defined as lower class children. The research on school achievement, intelligence, and social class has established a relatively consistent pattern: lower class children, as a group, are inferior to middle class children on measures of school achievement and intelligence. However, definitions using social class variables are inadequate for educational purposes in at least two ways. First, the relationship between social class variables and school success is not sufficiently great for adequate identification and prediction of individual children who are in need of special training. Although many measures produce statistically significant differences between the means of social class groups, there is usually some, and often considerable, overlap of distributions. As was shown in Table 5, there was some overlap of the distributions on Component I and considerable overlap on the other components in this study. Second, social class definitions fail to suggest the nature and extent of the educational problems, nor do they suggest the necessary remedial or compensatory steps to be taken. In short, definitions of cultural deprivation based on socioeconomic variables are of little value for educational purposes other than perhaps to describe the groups of children for whom these problems may exist. Similar problems can be noted with neurological descriptions of brain-damaged children which fail to behaviorally define these children, or to suggest remedial procedures.

Bereiter and Englemann (1966) have presented a logically convincing argument for defining cultural deprivation as language deprivation, especially for educational purposes. Essentially, the language deprivation which they discuss has to do with failure to learn the uses of language. The language problem of the culturally deprived concerns one's ability to obtain or transmit information, i.e., by using language as the primary information processing ability for data manipulations. Bereiter and Englemann further point out that lower class children may well have sufficient language for maintaining their social relationships and meeting their material needs. This would be consistent with Bernstein's (1960; 1961) theory of a restricted, as opposed to an elaborated, code.

The findings noted above appear to support strongly the position that cultural deprivation is essentially language deprivation, especially for educational purposes. Using a definition based on language variables, rather than socioeconomic variables, appears to be advantageous in terms of both identification and remedial or compensatory educational programming. Further, the definition should probably be based on language usage, rather than on such language variables as vocabulary.

The findings on this component analysis have some major implications for program planning for preschool and kindergarten children. It was noted above that General Language Ability was the most significant component to emerge from this analysis, and it was suggested as the major aspect of an effective educational definition. Further, it was noted in the discussion of the information process, or computer model, that language processing abilities are of central importance for efficient and successful data manipulation. The program of the computer is transmitted through the use of machine language, i.e., the symbol system employed for "telling" the machine what to do. The language of the program "tells" the computer what information to accept (determines the input); where it is to be stored; what operations are to be performed; what order the operations are to follow; and what output shall be given. Language is not the only medium for program direction in the human information processing system but it is the most important, especially for school work. How effectively and efficiently a person functions is dependent on the "program" that is used for processing data. Bereiter (1965) suggests that information processing abilities are the essence of intellectual functioning.

Thus, one may conclude that language training for culturally-deprived children is highly essential and should be given a central place in the program framework. If language is not sufficiently developed, severe restrictions are placed on the type and extent of possible data manipulations. Thus, children with underdeveloped language skills will be restricted in their ability to profit from "experiences," and will be inefficient in many learning situations, especially those presented in school. An analogy might be made to giving a deaf child the "experience" of going to the opera. Unless the child was taught some specific rules for interpreting the action on the stage, the "experience" would be essentially meaningless, since the child can't process the vocal data. The findings of this study strongly indicate that lower class boys of this age do not have the necessary language ability to process a wide range of "experience." This is not to say that the culturally-deprived child will gain nothing from "enrichment" or "experience," e.g., going to the fire station, but that this approach is inefficient. Without the basic language skills, "experience" will be of restricted meaning to the child in terms of intellectual development because he lacks the necessary "tools" for data manipulation.

Most preschool programs for the culturally-deprived are primarily designed to help these children to "catch up" with their middle class or culturally-enriched peers. The reality for the need for efficiency is apparent if one considers the problems involved in "catching up." If the culturally-deprived child is behind or retarded in development, the preschool program not only has to eliminate or overcome the initial deficit, but also has to obtain the "normal" growth while in the program. For example, if a child is a year behind, upon entering a preschool program at four years of age, the goal of most programs is to help the child to achieve to age norms by the beginning of kindergarten or age five. In other words, one is expecting or hoping to obtain two years of intellectual growth in one year of work. If this is the case, efficiency is highly important. If the preschool program is to be effective and efficient, it appears that language training should be the core of the program.

Further, the language training should probably be tightly structured. The schools should not assume that the lower class child can organize, or, perhaps, even recognize useful organizational frameworks or rules. The

findings on the Visual Classification and Structural Organization components indicate that this is the case. Consequently, it may be necessary to specifically teach the functional relationships of language. This suggests that language training will need to concern itself with teaching syntax, as well as developing vocabulary and other such language training goals. The child may have to be specifically taught how to use language as a means of processing information. Structure would seem to be essential for this type of training.

References

Anastasi, Anne, & D'Angelo, Rita Y. A comparison of Negro and white preschool children in language development and Goodenough Draw-a-Man IQ. *J. genet. Psychol.*, 1952, *81*, 147-165.

Beery, K. *Geometric form reproduction.* San Rafeal, Calif: Keith Beery, 1964.

Bereiter, C., & Englemann, S. *Preschool education for disadvantaged children.* Englewood Cliffs, N.J.: Prentice Hall, 1966.

Bernstein, B. Language and social class. *Brit. J. Sociol.*, 1960, *11*, 271-276.

Bernstein, B. Social class and linguistic development: A theory of social learning. In A. H. Halsey, J. Floud, & C. A. Anderson (Eds.), *Education, economy, and society.* New York: Free Press of Glencoe, 1961. Pp. 288-314.

Brodbeck, A., & Irwin, O. The speech behavior of infants without families. *Child Develpm.*, 1946, *17*, 145-156.

Davis, Edith A. The development of linguistic skill in twins, singletons with siblings, and only children from age five to ten years. *Institute of Child Welfare Monograph*, 1937, No. 14.

Day, Ella J. The development of language in twins: I. A comparison of twins and single children. *Child Develpm.*, 1933, *3*, 179-199.

Deutsch, M. The role of social class in language development and cognition. *Amer. J. Orthopsychiat.*, 1965, *35*, 78-88.

Eells, K. W., Davis, A., Havighurst, R. J., Herrick, V. E., & Tyler, R. W. *Intelligence and cultural differences: A study of cultural learning and problem-solving.* Chicago: University of Chicago Press, 1951.

Engelmann, S. Cultural deprivation: Description and remedy. Unpublished manuscript, Institute for Research on Exceptional Children, University of Illinois, 1964.

Feldman, J. Computer simulation of cognitive processes. In Harold Borko (Ed.), *Computer applications in the behavioral sciences.* Englewood Cliffs, N. J.: Prentice-Hall, 1962.

Gehlbach, Sally J. A comparison of language skills of culturally disadvantaged and culturally privileged pre-kindergarten children. Unpublished master's thesis, University of Illinois, 1965.

Herrick, V. E. What is already known about the relation of the IQ to cultural background. In E. Eells, et al. (Eds.), *Intelligence and cultural differences*. Chicago: University of Chicago Press, 1951.

Irwin, O. C. Infant speech: The effect of family occupational status and of age on sound frequency. *J. speech & hear. Disord.* 1948, *13*, 224-226. (a)

Irwin, O. C. Infant speech: The effect of family occupational status and of age on sound types. *J. speech & hear. Disord.*, 1948, *13*, 320-822. (b)

John, Vera P. The intellectual development of slum children: Some preliminary findings. *Amer. J. Orthopsychiat.*, 1963, *33*, 813-822.

Jones, H. E. Environmental influences on mental development. In Leonard Carmichael (Ed.), *Manual of child psychology*. New York: John Wiley, 1946. Pp. 582-632.

Jones, H. E. The environment and mental development. In Leonard Carmichael (Ed.), *Manual of child development*. New York: John Wiley, 1954. Pp. 631-696.

Kass, Corrine E. Some psychological correlates of severe reading disability (dyslexia). Unpublished doctoral dissertation, University of Illinois, 1962.

Masland, R. L., Sarason, S. B., & Gladwin, T. *Mental subnormality*. New York: Basic Books, 1958.

McCandless, B. Environment and intelligence. *Amer. J. ment. Defic.*, 1952, *56*, 674-691.

McCandless, B. Relation of environmental factors to intellectual functioning. In H. A. Stevens, & R. Heber (Eds.), *Mental retardation: A review of research*. Chicago: University of Chicago Press, 1964. Pp. 175-213.

McCarthy, Dorothea. Language development of the preschool child. *Institute of Child Welfare Monograph*, 1930, No. 4.

McCarthy, J. J., & Kirk, S. A. *Illinois test of psycholinguistic abilities: Experimental edition*. Urbana, Illinois: Institute for Research on Exceptional Children, University of Illinois, 1961.

McCarthy, Jeanne McRae. Patterns of psycholinguistic development of Mongoloid and non-Mongoloid severely retarded children. Unpublished doctoral dissertation, University of Illinois, 1965.

Ryckman, David B. Psychological processes of disadvantaged children. Unpublished doctoral dissertation, University of Illinois, 1966.

Sarason, S. B., & Gladwin, T. Psychological and cultural problems in mental subnormality: A review of research. *Genet. Psychol. Monogr.*, 1958, *57*, 3-290.

Siller, J. Socioeconomic status and conceptual thinking. *J. abnorm. soc. Psychol.*, 1957, *55*, 365-371.

Simmons, R. F. Syntax: Toward computer synthesis of human language behavior. In Harold Borko (Ed.), *Computer applications in the behavioral sciences*. Englewood Cliffs, N. J.: Prentice-Hall, 1962.

Smith, Madorah E. A study of some factors influencing the development of the sentence in preschool children. *J. genet. Psychol.*, 1935, *46*, 182-212.

Taylor, D. W. Toward an information processing theory of motivation. In M. R. Jones (Ed.), *Nebraska symposium on motivation*. Lincoln, Nebraska: University of Nebraska Press, 1960.

U. S. Bureau of the Census. *U. S. census of population and housing: 1960. Census tracts: Chicago, Illinois*. Final Report PHC (1)-26. Washington, D. C.: U. S. Government Printing Office, 1962.

Weiner, P. S., Wepman, J. M., & Morency, Anne S. A test of visual discrimination. *Elemen. School J.*, 1965, *65*, 330-337.

Wepman, J. M. *Auditory discrimination test: Manual of directions*. Chicago: Language Research Associates, 1958.

Young, Florence M. An analysis of certain variables in a developmental study of language. *Genet. Psychol. Monogr.*, 1941, *23*, 3-141.

Table 1

Socioeconomic Data for the City and Each of the Seven Census Tracts

Area	Percentage of White-Collar Workers in Labor Force	Family Income		Median Years of School Completed	Number of Rooms Per Dwelling		Percentage of Dwellings with 0.75 Persons or Less per Room	Percentage of Owner Occupied to Total Occupied Dwellings
		Median	Q*		Median	Q		
City	46.1	$6,738	$2,470	10.0	4.4	1.1	61.3	34.2
Middle Class								
Tract 1	52.3	7,668	2,130	12.2	5.2	0.4	74.3	56.3
Tract 2	47.5	8,379	2,820	12.0	5.8	1.1	60.4	97.8
Tract 3	48.2	8,837	3,205	12.2	5.4	.7	62.5	87.4
Lower Class								
Tract 4	27.6	4,618	2,100	10.0	3.0	1.5	40.3	10.7
Tract 5	26.0	5,083	2,305	9.7	3.2	1.6	41.5	12.9
Tract 6	24.5	4,175	2,040	9.4	2.5	1.6	35.4	03.7
Tract 7	19.3	4,740	2,960	9.2	2.9	1.1	36.3	04.5

*Q means semi-interquartile range

Table 2

Component Names, Variables, Component Loadings, and Accountable Variance

Component	Name	Variable	Component Loadings	Accountable Variance
I	General Language Ability	Memory for sentences (CMT)	.771	38 per cent
		Auditory-vocal-association (ITPA)	.664	
		Vocal encoding (ITPA)	.663	
		Encoding (CMT)	.661	
		Auditory closure (Ryckman-Bereiter-Powell)	.661	
		Auditory-vocal-sequential (ITPA)	.658	
		Auditory decoding (ITPA)	.611	
		Pattern (CMT)	.589	
		Visual-motor-sequential (ITPA)	.559	
		Auditory-vocal-automatic (ITPA)	.558	
		Syntax (CMT)	.444	
		Beery-Buktenica DFS	.406	
II	Structural Organization	Visual memory (CTVD)	.855	20 per cent
		Visual discrimination (CTVD)	.662	
		Syntax (CMT)	.559	
		Beery-Buktenica DFS	.532	
		Auditory-vocal-automatic (ITPA)	.432	
III	Visual Imagery	Visual-motor-association (ITPA)	.810	19 per cent
		Visual closure (McCarthy-Kass)	.612	
		Visual-motor-sequential (ITPA)	.496	
		Visual decoding (ITPA)	.493	
IV	Visual Classification	Motor encoding (ITPA)	.824	
		Visual decoding (ITPA)	.507	
V	Chronological Age	Chronological Age	.909	10 per cent
		Visual closure (McCarthy-Kass)	-.408	

Table 3

Biserial Coefficients of Correlation Between Socioeconomic Status and Component Scores

Component	Biserial Correlation	Percent of Accountable Variance
I	.587	34.5
II	.225	5.1
III	.227	5.2
IV	.390	15.2
V	-.171	2.9

Table 4

"t" Tests from Component Scores for Five Components Between the Middle Class and Lower Class Groups

	Component	Middle Class		Lower Class		t	P
		mean	s.d.	mean	s.d.		
I	General Language Ability	.465	.950	-.468	.821	5.256	<.001
II	Structural Organization	.182	1.042	-.176	.868	1.813	<.10
III	Visual Imagery	.180	1.109	-.182	.850	1.833	<.10
IV	Visual Classification	.309	.754	-.309	1.121	3.219	<.01
V	Chronological age	-.137	1.023	.134	.999	-1.359	<.20

Table 5

Percentage of Overlap of Class Medians on Five Components

	Percentage of Middle Class Below Lower Class Medians	Percentage of Lower Class Above Middle Class Medians
Component I	20	16
Component II	32	30
Component III	44	26
Component IV	34	22
Component V	54	56